

**REMARKS**

Please reconsider the application in view of the following remarks. Applicant thanks the Examiner for carefully considering this application.

**Disposition of the Claims**

Claims 1-14 are pending in the present patent application. Claims 1 and 8 are independent. The remaining claims depend, either directly or indirectly, from claims 1 and 8.

**Rejections under 35 U.S.C. §102**

Claims 1-14 stand rejected under 35 U.S.C. §102(b) as being clearly anticipated by U.S. Patent No. 5,689,139 issued to Bui (hereinafter "Bui"). For the reasons set forth below, this rejection is respectfully traversed.

Independent claims 1 and 8 require, in part, the existence of a bump, a plurality of vias, and of a first slot formed in the metal layer between the bump and the plurality of vias. The Examiner asserts Bui's element 53 in Figure 5 (apparently misidentified as "43" in column 7, line 62) is a bump because it is a "relatively abrupt protuberance on a surface". (See Final Office Action dated March 4, 2005 at page 2 and page 3). Bui's Figure 5 illustrates insulating layers (element 52) surrounding a via (element 51). Bui's via (element 51) is a tunnel cutting vertically through the otherwise solid insulating layers (element 52). Bui discloses filling the via (element 51) with a tungsten plug or a plug comprising aluminum (element 53; column 7, lines 57-63). Applicant respectfully asserts the plug (element 53) disclosed in Bui is not equivalent to the bump recited in the claims of the present invention. The structure shown in Figure 5 of Bui may be representative of a portion of one of the metal layers (M1-M7) in Figure 4a of the present application. In other words, Bui discloses a structure for metal interconnection lines within an

integrated circuit. Bui is not at all concerned with electromigration at the bumps that are used to sink/source signals between the chip package and the integrated circuit components.

Further, the bump and vias recited in claims 1 and 8 of the present invention are clearly recited as separate elements. The bump of the present invention *is not* inserted into the vias of the present invention for any reason. Thus, the relationship between the plug and vias as disclosed in Bui is not equivalent to the relationship between the bump and vias as recited in independent claims 1 and 8. Thus, the plug disclosed in Bui clearly *cannot* be the equivalent of the bump recited in the present invention. Thus, Bui fails to teach *all* limitations of independent claims 1 and 8. Therefore, claims 1 and 8 are patentable over Bui. Claims 2-7 and 9-14 depend, either directly or indirectly, from claims 1 and 8 and are patentable for at least the same reason. Accordingly, withdrawal of this rejection is respectfully requested.

### **Rejections under 35 U.S.C. §103**

Claims 1-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's Admitted Prior Art and Bui. For the reasons set forth below, this rejection is respectfully traversed.

As discussed above, Bui at least does not disclose the bump as recited in independent claims 1 and 8. Therefore, Bui cannot teach or suggest a slot formed in a metal layer between vias and a bump as recited in independent claims 1 and 8.

Applicant's Admitted Prior Art discloses a prior art bump and via structures that are susceptible to current crowding at the bump. Like Bui, Applicant's Admitted Prior Art fails to disclose, or otherwise teach, a slot formed in a metal layer between vias and a bump. Further, as Applicant's Admitted Prior art is silent as to the existence of current crowding, there is no

suggestion in Applicant's Admitted Prior Art to form structures or deformities in the metal layer between the vias and the bump to optimize current distribution and thus minimize current crowding at the bump.

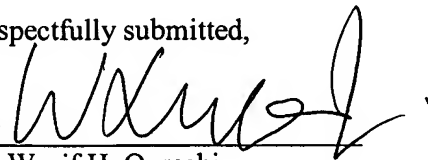
In view of the above, Applicant's Admitted Prior Art and Bui, whether considered separately or in combination, fail to teach or suggest all the limitations recited in independent claims 1 and 8 of the present invention. Thus, independent claims 1 and 8 of the present application are patentable over Applicant's Admitted Prior Art and Bui. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

#### Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03226/157001; P6865).

Dated: April 8, 2005

Respectfully submitted,

By 

Wasif H. Qureshi

Registration No.: 51,048

OSHA & MAY L.L.P.

1221 McKinney Street, Suite 2800

Houston, Texas 77010

(713) 228-8600

(713) 228-8778 (Fax)

Attorney for Applicant

Attachments



Application No. (if known): 10/033,008

Attorney Docket No.: 03226/157001; P6865

## Certificate of Express Mailing Under 37 CFR 1.10

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail, Airbill No. EV562272047US in an envelope addressed to:

MS AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

on April 8, 2005  
Date

*Brenda C. McFadden*

Signature

Brenda C. McFadden

Typed or printed name of person signing Certificate

Registration Number, if applicable

(713) 228-8600

Telephone Number

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

Response to Final Office Action dated March 4, 2005